

Bellwork: 12/17/12

Factor each expression:

1) $18x^2 - 98$

$2(9x^2 - 49)$

$2(3x + 7)(3x - 7)$

2) $6x^2 - 33x + 36$

$3(2x^2 - 11x + 12)$

$(2x^2 - 3x)(-8x + 12)$
 $x(2x - 3) - 4(2x - 3)$

$3(2x - 3)(x - 4)$

$(6x - 9)(x - 4)$

$(2x - 3)(3x - 12)$

$3(2x - 3)(x - 4)$

		+24
1		24
2		12
-3		-8
4		6

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Section 4.5 - Solving Quadratic Equations

When you are asked to find the ROOTs or ZEROs of a function, it all means the same thing...

FIND THE X-INTERCEPTS (remember they occur when $y=0$)

Therefore, to find the ROOTs or ZEROS of any quadratic equation, simply set the function equal to 0 and solve for x .

There are many ways to solve a quadratic equation, the easiest being to solve by FACTORING!

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Solve each of the following equations by factoring:

1) $x^2 + 5x + 6 = 0$

$$\begin{array}{r|l} 6 & \\ \hline 3 & 2 \end{array}$$

$$(x+3)(x+2) = 0$$

$$x+3=0$$

$$\boxed{x = -3}$$

$$x+2=0$$

$$\boxed{x = -2}$$

$$x = -2, -3$$

check:

$$(-3)^2 + 5(-3) + 6 = 0$$

$$9 - 15 + 6 \quad \checkmark$$

$$-6 + 6 = 0$$

$$(-2)^2 + 5(-2) + 6 = 0$$

$$4 - 10 + 6 \quad \checkmark$$

$$-6 + 6 = 0$$

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2) $x^2 - 16 = 0$

$$(x+4)(x-4) = 0$$

$$x+4=0$$

$$\boxed{x = -4}$$

$$x-4=0$$

$$\boxed{x = 4}$$

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$$3) \quad 3x^2 - x - 2 = 0$$

$$3x^2 - x - 2 = 0$$

$$\begin{array}{r|l} -6 & \\ 1 & 6 \\ \hline 2 & -3 \end{array} \quad \text{calc!}$$

$$(3x^2 - 3x) + 2x - 2 = 0$$

$$3x(x-1) + 2(x-1) = 0$$

$$(x-1)(3x+2) = 0$$

$$3(-2/3)^2 - (-2/3) = ?$$

$$3(-2/3)^2 - (-2/3)$$

$$\begin{array}{r} x - x = 0 \\ +1 \quad +1 \\ \hline \boxed{x = 1} \end{array}$$

$$\begin{array}{r} 3x + 2 = 0 \\ -2 \quad -2 \\ \hline 3x = -2 \\ \frac{3x}{3} = \frac{-2}{3} \\ \boxed{x = -\frac{2}{3}} \end{array}$$

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$$4) \quad 5x^2 + 7x = 0$$

$$x(5x + 7) = 0$$

$$x = 0$$

$$\boxed{x = 0}$$

$$\begin{array}{r} 5x + 7 = 0 \\ -7 \quad -7 \\ \hline 5x = -7 \end{array}$$

$$\begin{array}{r} 5x = -7 \\ \frac{5x}{5} = \frac{-7}{5} \\ \boxed{x = -\frac{7}{5}} \end{array}$$

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$$5) 6x^2 = 4x$$

$$6x^2 - 4x = 0$$

$$2x(3x - 2) = 0$$

$$6(2/3)^2 = ?$$

$$4(2/3) = ?$$

$$\frac{2x}{2} = \frac{0}{2}$$

$$\boxed{x = 0}$$

$$\frac{3x - 2}{+2 \quad +2} = 0$$

$$\frac{3x}{3} = \frac{2}{3}$$

$$\boxed{x = \frac{2}{3}}$$

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$$6) 6x^2 - 15x - 6 = 1 - 4x$$

$$6x^2 - 11x - 7 = 0$$

$$(6x^2 + 3x - 14x - 7) = 0$$

$$3x(2x + 1) - 7(2x + 1) = 0$$

$$(2x + 1)(3x - 7) = 0$$

$$2x + 1 = 0$$

$$2x = -1$$

$$\boxed{x = -\frac{1}{2}}$$

$$3x - 7 = 0$$

$$3x = 7$$

$$\boxed{x = \frac{7}{3}}$$

$$\begin{array}{r|l} -42 & \\ 1 & 42 \\ 2 & 21 \\ \hline 3 & 14 \\ 6 & 7 \end{array}$$

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